FIELD AND LABORATORY TESTING OF THE TNO DISCONNECTED RIFLE SIGHT

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TNO Human Fa rs

TNO Defensieonderzoek

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S M P
soldier modernisation programme

Two main advantages of a disconnected sight

- Reduction in vulnerability (= hard to hit)
- Camouflage (= hard to see)

Reduction in vulnerability

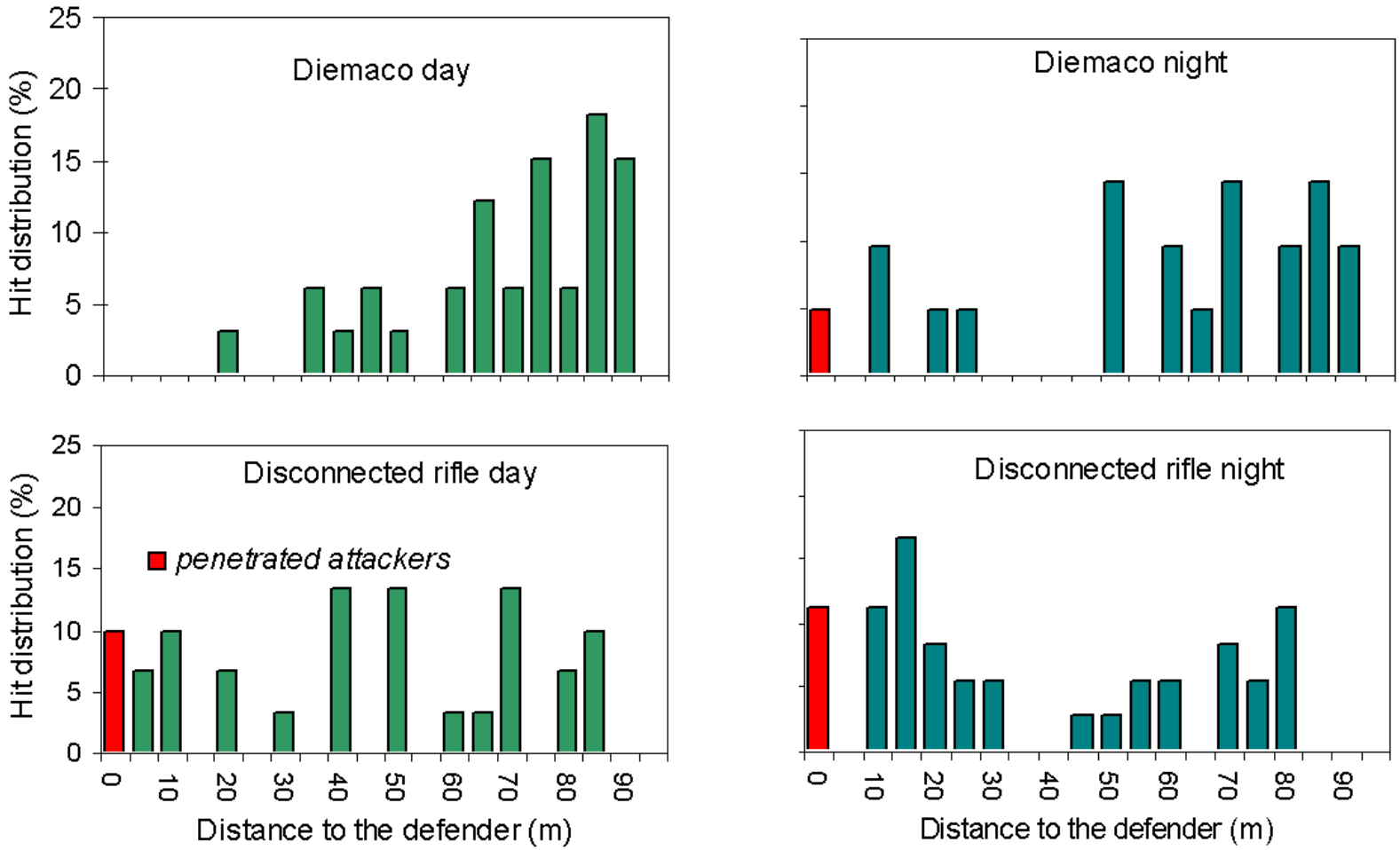
←Day Night ↓

Camouflage at night

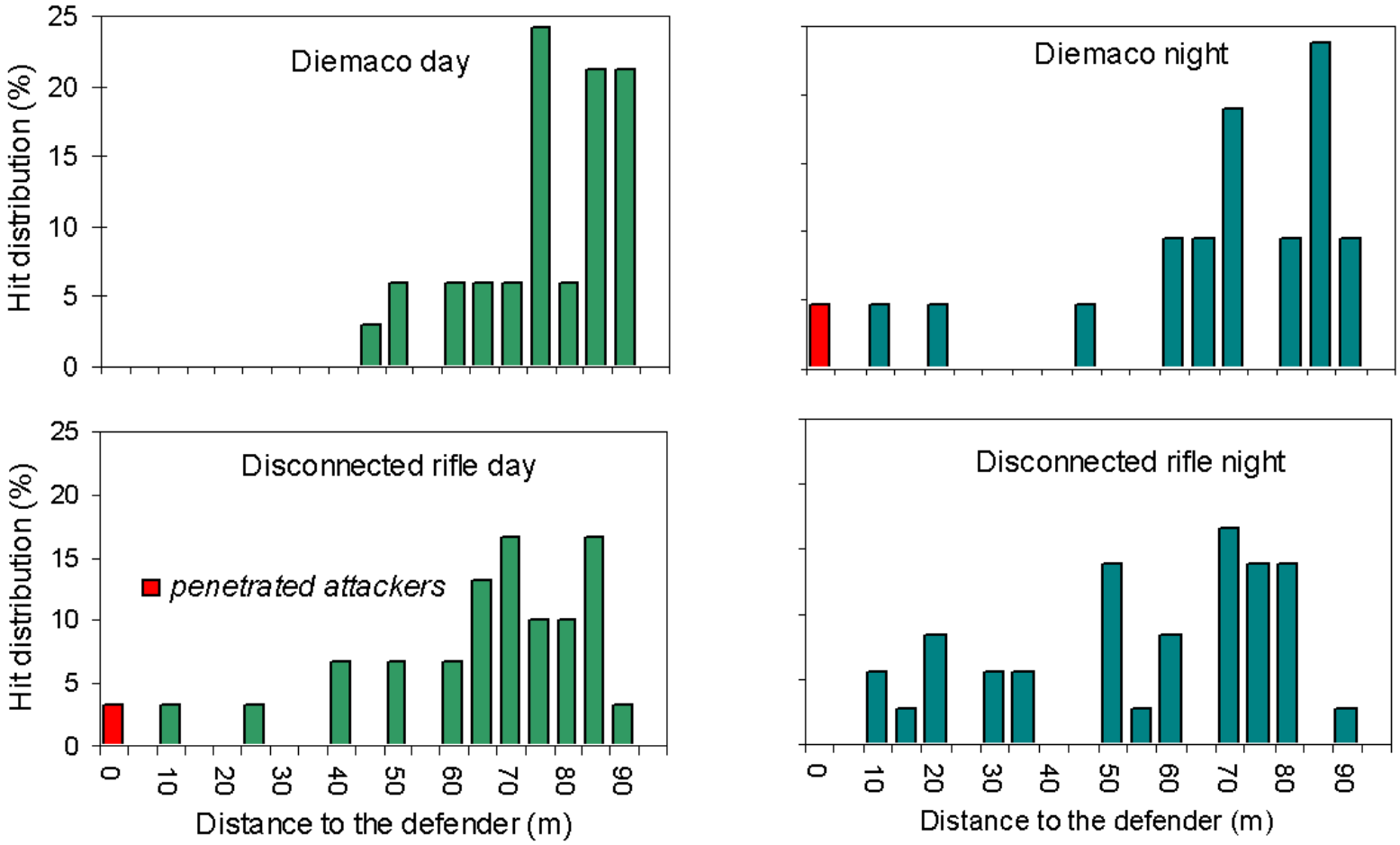
	Intensified	thermal
Uncovered (Standing)		
Under cover (disconnected)		

Field experiment with ‘phase 1’ foxhole

Hit distribution of the 3 attacke



Hit+ 1st near miss distributio



Results of the field trial

1) Defensive capabilities

The safety in the foxhole has dramatically improved.

2) Attacking capabilities

The disconnected rifle sight was reasonably effective, but better is required.

The two main limitations were:

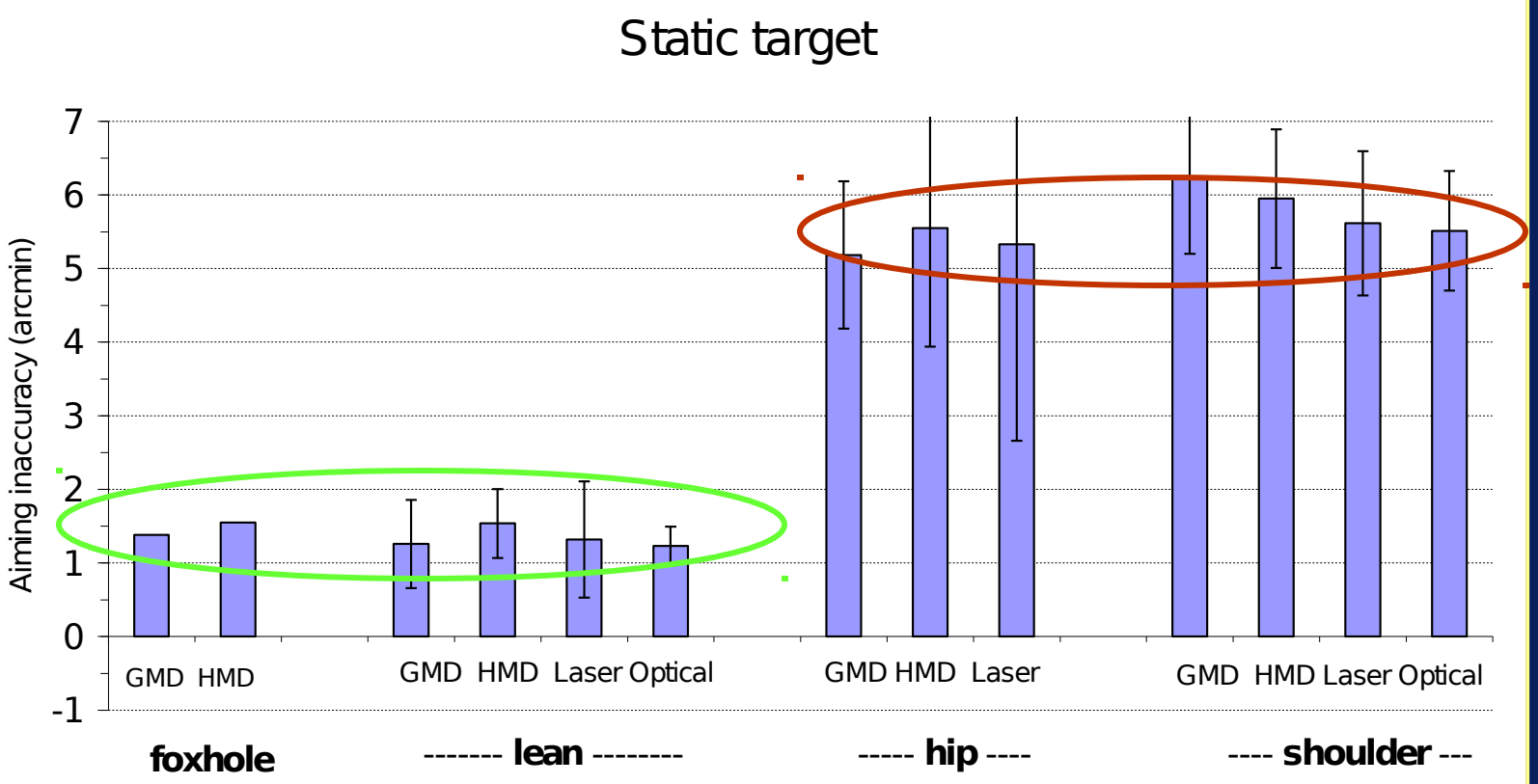
1. Postural stability in the fox hole
2. Long search times due to the limited FOV

Laboratory trials on aiming accuracy

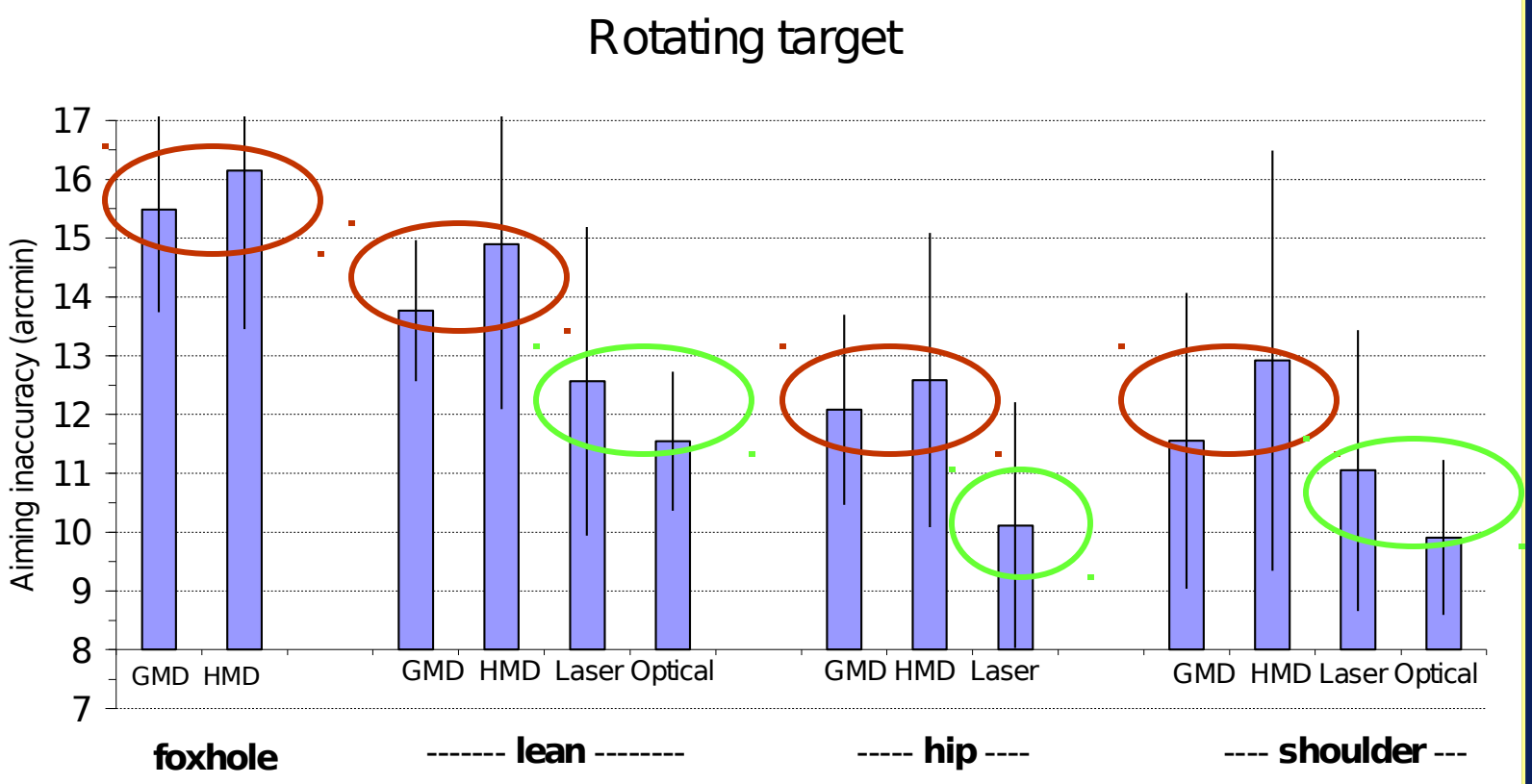
Laboratory parameters

- 4 postures
- 4 sights
- static and rotating targets

Aiming accuracy {static}



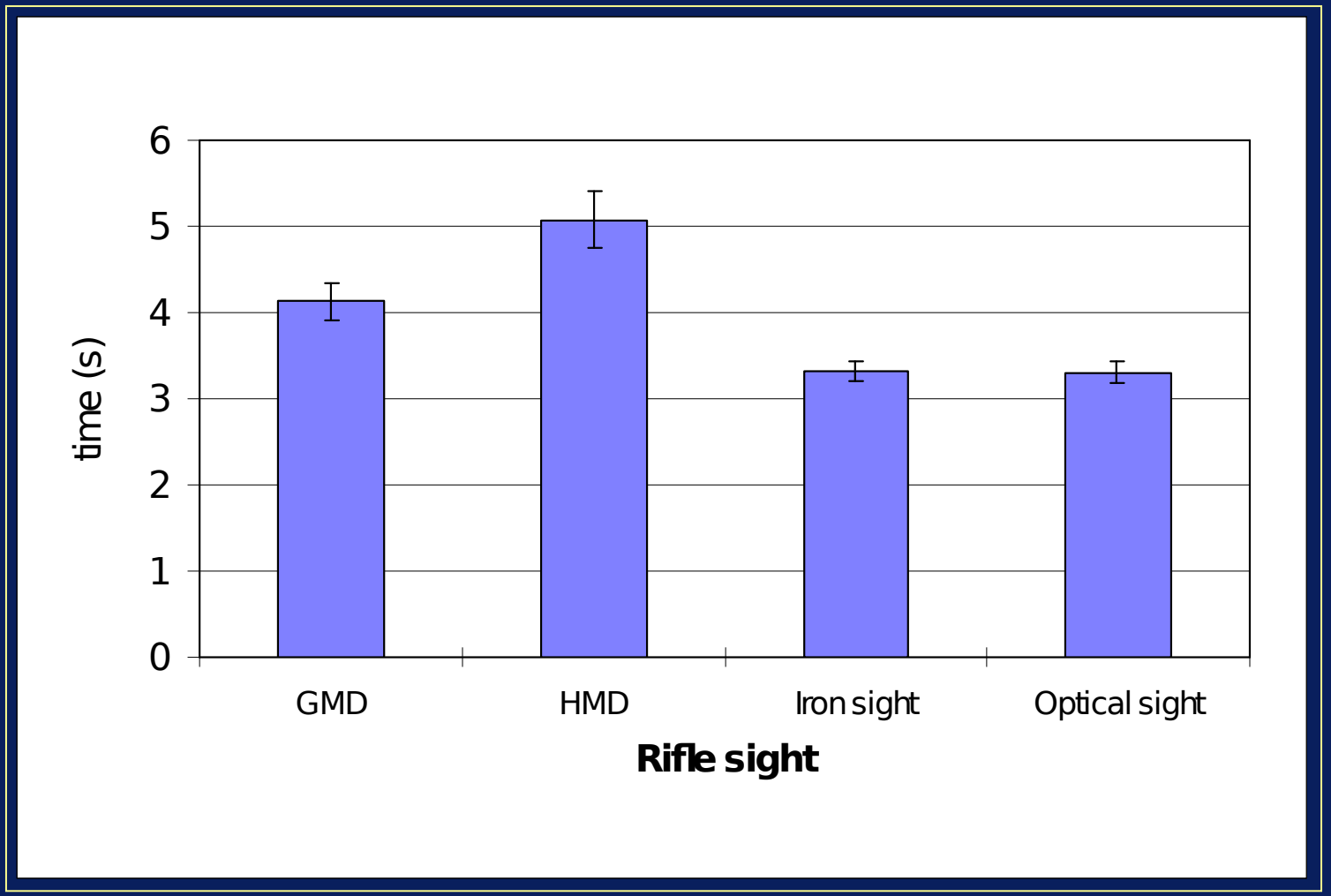
Aiming accuracy {dynamic}



Aiming accuracy results

Simply said, the aiming accuracy with the disconnected rifle sight is pretty good!

Aiming speed



Weapon sight	Visual drawbacks affecting aiming speed
Aim-point	• Approximate eye positioning required
Laser pointer	• Dot visibility depends on scene brightness and object reflectivity • When using off-axis, potential occlusion by terrain
Iron sight	• Change in accommodation • Exact eye positioning required • Tendency to close the other eye
Optical sight	• Eye movements required to acquire the target a 2nd time • Exact eye positioning required
GMD	• Change in accommodation • Large eye movement to fixate the display (when used off-axis) • Eye movements are required to acquire the target in the display
HMD	• Aim the weapon first, checking it with peripheral vision • Large eye movement to fixate the display • Eye movements are required to acquire the

Combined conclusions

- The disconnected sight offers good static aiming accuracy and excellent protection.
- Reaction time, mobility, and situation awareness are significantly reduced.
- In dynamic situations, requiring fast or continued weapon aiming, the accuracy also suffers.

What is next

- Disconnected training
- Combination of disconnected and direct view sights
- Combination of SA & rapid inspection
- Integrated head protection
- Computer simulation (e.g. IUSS)

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